

Remarks

Amendments

Claims 40, 51, 60, 67, 69, and 84 are amended herein to correct errors of a typographic or editorial nature (claim dependencies, antecedent basis for claim recitations, spelling). No new matter is introduced by any of the amendments, and entry thereof is requested.

Claims 1 - 95 are in the application, of which claims 86 - 94 have been withdrawn as being directed to a nonelected species. Accordingly, claims 1 - 85 and 95 are under consideration in the application.

Election of Species

The Examiner asserted that the “application contains claims directed to the following patentably distinct species:

Species 1, claims 1-2, pertaining to a MRAM wherein the cell structure is a GMR device;

Species 2, claims 1-3, pertaining to a MRAM wherein the cell structure is a MTJ device;

Species 3, claims 1-4, pertaining to a MRAM wherein the cell structure comprises a conductor layer;

Species 4, claims 1, 5, pertaining to a MRAM wherein the cell structure comprises an insulator layer;

Species 5, claims 1, 6, pertaining to a MRAM wherein the spin filtering element includes a ferromagnetic material;

Species 6, claims 1, 7-10, pertaining to a MRAM wherein spin filtering element includes a Heusler alloy;

Species 7, claims 1, 11, pertaining to a MRAM wherein spin filtering element includes an oxide based alloy;

Species 8, claims 1, 12-13, pertaining to a MRAM wherein spin filtering element includes a Mn based CMR material;

Species 9, claims 1, 14-16, pertaining to a MRAM wherein spin filtering element includes a Mn based ferromagnetic material;

Species 10, claims 1, 17-19, pertaining to a MRAM wherein spin filtering element includes a oxide based ferromagnetic material;

Species 11, claims 1, 20-21, pertaining to an MRAM wherein the spin holding element comprises a high spin diffusion length;

Species 12, claims 1, 22-24, pertaining to an MRAM wherein the spin holding element comprises B_i ;

- Species 13, claims 1, 25-29, pertaining to an MRAM wherein the spin holding element is metal;
- Species 14, claims 1, 30-32, pertaining to an MRAM wherein the cell structure is an MTJ having first and second ferromagnetic layers separated by an insulator;
- Species 15, claims 1, 30, 33-34, 40, pertaining to an MRAM including a MTJ and a 3d transition ferromagnet material; [...]
- Species 16, claims 1, 30, 35-36, pertaining to an MRAM including an MTJ and a 1st and 2nd ferromagnet layer comprising Heusler alloy;
- Species 17, claims 1, 37-38, pertaining to an MRAM including an MTJ and a 1st and 2nd ferromagnet layer comprising an oxide based alloy;
- Species 18, claims 1, 39,41, pertaining to an MRAM wherein the cell structure is an GMR having first and second ferromagnetic layers separated by a conductor;
- Species 19, claims 1, 39, 42-43, pertaining to an MRAM including a GMR and a 3d transition ferromagnet material;
- Species 20, claims 1, 39, 44-45, pertaining to an MRAM including an GMR and a 1st and 2nd ferromagnet layer comprising Heusler alloy;
- Species 21, claims 1, 39, 46-47, pertaining to an MRAM including an GMR and a 1st and 2nd ferromagnet layer comprising an oxide based alloy;
- Species 22, claims 1, 30, 48-49, pertaining to an MRAM including a spin-valve MJT;
- Species 23, claims 1, 30, 32, 49, 50-51, pertaining to an MRAM including a MJT and a pinning layer comprising an antiferromagnetic multilayer;
- Species 24, claims 1, 30, 32, 49, 53-54, pertaining to an MRAM including a MJT and a pinning layer comprising a synthetic antiferromagnetic multilayer;
- Species 25, claims 1, 30, 32, 49, 55-56, pertaining to an MRAM including a MJT and a pinning layer comprising an antiferromagnetic multilayer and a synthetic antiferromagnetic multilayer;
- Species 26, claims 1, 30, 32, 49, 57-58, pertaining to an MRAM including a MJT and a pinning layer comprising a permanent magnet material;
- Species 27, claims 1, 30, 59-62, pertaining to an MRAM including a pseudo-spin valve MTJ with a soft ferromagnetic layer;
- Species 28, claims 1, 30, 63-65, pertaining to an MRAM including a MTJ comprising a granular material;
- Species 29, claims 1, 39, 66-67, pertaining to an MRAM including a spin-valve GMR;
- Species 30, claims 1, 39, 67-70, pertaining to an MRAM including a GMR and a pinning layer comprising an antiferromagnetic multilayer;
- Species 31, claims 1, 39, 67, 71-72, pertaining to an MRAM including a GMR and a pinning layer comprising a synthetic antiferromagnetic multilayer;

Species 32, claims 1, 39, 41, 67, 73-74, pertaining to an MRAM including a GMR and a pinning layer comprising an antiferromagnetic multilayer and a synthetic antiferromagnetic multilayer;

Species 33, claims 1, 39, 41, 67, 75-76, pertaining to an MRAM including a GMR and a pinning layer comprising a permanent magnet material;

Species 34, claims 1, 39, 77-80, pertaining to an MRAM including a pseudo-spin valve GMR with a soft ferromagnetic layer;

Species 35, claims 1, 39, 81-83, pertaining to an MRAM including a GMR comprising a granular material;

Species 36, claims 1, 39, 84-85, pertaining to a MRAM with a GMR multilayer structure.

Species 37, claims 1, 95, pertaining to an MRAM array.”

Applicants elect Species 1, “pertaining to a MRAM wherein the cell structure is a MTJ device”, for prosecution on the merits in this application. The following is a listing of claims believed to be readable on the elected species:


1, 3, 5, 30 - 38, 48 - 63.

As the Examiner noted, claim 1 is generic.

All the claims in the application are believed to be in condition for allowance, and action to that effect is respectfully requested.

If the Examiner determines that a conference would facilitate prosecution of this application, the Examiner is invited to telephone Applicant’s representative, undersigned, at the telephone number set out below.

Respectfully submitted,

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